

What is claimed is:

1. A chemically-amplified positive photoresist composition comprising a resin, a photoacid generator compound, and an acid.
2. The photoresist of claim 1 wherein the acid is an organic acid.
3. The photoresist of claim 1 or 2 wherein the acid is a non-polymeric acid.
4. The photoresist of any one of claims 1 through 3 wherein the acid has a molecular weight of about 150 or less.
5. The photoresist of any one of claims 1 through 4 wherein the acid has from 2 to 10 carbon atoms and is optionally substituted by hydroxy or alkoxy.
6. The photoresist of any one of claims 1 through 5 wherein the acid has a carboxylic acid group.
7. The photoresist of any one of claims 1 through 6 wherein the resin comprises phenolic groups.
8. The photoresist of any one of claims 1 through 6 wherein the resin comprises phenolic and alkyl acrylate groups.
9. The photoresist of any one of claims 1 through 6 wherein the resin is at least essentially free of aromatic groups.
10. The photoresist of any one of claims 1 through 6 wherein the resin comprises polymerized units of cyclic olefin groups and/or anhydride groups.

11. The photoresist of any one of claims 1 through 6 wherein the resin is fluoro-substituted.
12. The photoresist of any one of claims 1 through 11 further comprising a basic component.
13. The photoresist of claim 12 wherein the basic component is an amine.
14. The photoresist of claim 12 or 13 wherein the basic component is a tetraalkyl ammonium compound.
15. The photoresist of any one of claims 1 through 14 wherein the photoresist comprises a solvent that contains an ester moiety.
16. The photoresist of any one of claims 1 through 15 wherein the photoresist contains a solvent component that comprises ethyl lactate.
17. The photoresist of claim 16 wherein the added base is lactic acid.
18. The photoresist of any one of claims 1 through 17 wherein the photoresist contains a solvent component that comprises propylene glycol methyl ether acetate.
19. The photoresist of claim 18 wherein the acid is acetic acid.
20. A method of forming a photoresist relief image comprising:
  - (a) applying a coating layer of a photoresist composition of any one of claims 1 through 19 on a substrate;
  - (b) exposing the photoresist coating layer to patterned activating radiation and developing the exposed photoresist layer to provide a relief image.

21. The method of claim 20 wherein the photoresist coating layer is exposed to radiation having a wavelength of less than about 300 nm.

22. The method of claim 20 wherein the photoresist coating layer is exposed to radiation having a wavelength of less than about 200 nm.

23. A method of forming a photoresist image comprising:

(a) admixing a resin, photoacid generator compound, an acid and solvent to provide a chemically-amplified photoresist composition;

(b) applying a coating layer of the photoresist composition on a substrate; and

(c) exposing the photoresist coating layer to activating radiation and developing the exposed photoresist layer to provide a photoresist image,

wherein the photoresist composition is stored for at least 60 days between providing the photoresist composition in step (a) and applying the photoresist composition in step (b).

24. The method of claim 23 wherein the photospeed of the photoresist composition decreases by no more than about 8 percent between providing the photoresist composition in step (a) and applying the photoresist composition in step (b).

25. The method of claim 23 wherein the photospeed of the photoresist composition decreases by no more than about 5 percent between providing the photoresist composition in step (a) and applying the photoresist composition in step (b).

26. The method of claim 23 wherein the photospeed of the photoresist composition decreases by no more than about 2 percent between providing the photoresist composition in step (a) and applying the photoresist composition in step (b).

27. The method of any one of claims 23 through 26 wherein the photoresist composition is stored for at least 90 days between providing the photoresist composition in step (a) and applying the photoresist composition in step (b).

28. The method of any one of claims 23 through 26 wherein the photoresist composition is stored for at least 9 months between providing the photoresist composition in step (a) and applying the photoresist composition in step (b).

29. The method of any one of claims 23 through 28 wherein the photoresist composition is stored at room temperature.

30. The method of any one of claims 23 through 29 wherein the photoresist composition is stored below about 20°C.

31. An article of manufacture having on at least one surface a coating layer of the photoresist composition of any one of claims 1 through 19.

32. The article of claim 31 wherein the photoresist composition is coated on a microelectronic wafer substrate.

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